DON'T ROLL YOUR EYES

By Lt. Rob Littman

As I near the end of my first JO tour, I have accrued 750 hours in twin-engine aircraft, 120 hours in single-engine aircraft and, because of recent events, a little over 90 seconds in "zero engine" aircraft. I'm still not sure how to log the flight time.

Our squadron was just over two months into cruise, flying Lot X and XI FA-18Cs in support of Operations Enduring Freedom and Iraqi Freedom. I was scheduled for a 45-minute day-currency and CQ flight in the Arabian Gulf, following our first port call. We had no clouds to speak of, although the visibility was Gulf standard: three to five miles in dust and haze. The flight began as I knocked out a few practice plugs and then logged some SSC (surface search and control) time before meeting the other squadron section overhead for recovery. As I started to join with the other two aircraft, my

impromptu NATOPS check ride began.

Immediately after advancing the throttles to military power, I heard a loud bang from the right side, and the engine began to flame out. I pulled the throttle to idle and heard another loud bang—the engine had flamed out. I told the section lead I had lost my right motor. I assumed lead and requested they join on me. As our three-ship headed toward mom, we stepped through all the displayed cautions.

Besides the associated cautions, rpm and fuel flow read zero, and the EGT was steady at 80 degrees Celsius, so we agreed to turn off the right engine. I had read tales of pilots securing the wrong throttle, so I made sure my hand was on the right throttle, then pulled it to "Off."

Our operations officer, a former FRS instructor and CAG paddles, arrived in CATCC. The radio representative and I quickly brought him up to speed. With things now well in hand, he instructed the other two aircraft to proceed to marshal for the day, Case III restricted-visibility recovery. About this time, I received FCS and FLAPS OFF cautions and notified the rep. Bringing up the FCS page, I found the leading-edge-flap servos in channels 2 and 3 were X'd out. With no secondary indications from the right motor, we decided to crossbleed the right engine to restore the hyd-2 system for a flight-control reset. This action cleared the FCS and FLAPS OFF cautions.

We decided to try a single-engine CV recovery. The rep instructed me to lower the gear to make sure we could get three-down-and-locked. Then I would dump fuel to single-engine, maximum-trap weight in preparation for a single-engine approach. At 91 degrees Fahrenheit and near 100-percent humidity, the single-engine-recovery weight was about 30,000 pounds, which meant I would need to dump almost 8,000 pounds of fuel to make the single-engine ball call at 2,700 pounds.

Maintaining altitude with one engine at my current aircraft weight was much more difficult than expected. I had the dumps on as I descended to 2,000 feet, but I could not stay level at military power. I had to use afterburner (AB) to climb to 3,000 feet and then reduce the throttle to military power to select the dumps and squeeze out more gas. I repeated this process until my fuel state was below 5,000 pounds, which allowed me to maintain level flight.

I set up for the approach and coordinated with paddles. At two-and-a-half miles, I realized the ship's wake was angling off to my right by more than 30 degrees. I asked for confirmation of the given final bearing of 262, and was told it now was 298 degrees. I felt too close to make an aggressive correction on one engine, so I made a left 330-degree turn and set up for the proper FB (final bearing). Although this move solved my lineup problem, it also forced me lower and slower, without room or energy to fix it, and prompted paddles to give me a timely waveoff. I first tried a military powered waveoff but didn't get the desired response. I selected full AB for a safe climb away from the deck.

With directions to tank, I picked up the Super Hornet tanker and proceeded to join. The pilot asked if I would be tanking dirty, and I said "yes." After only a short time, I told the rep it was impossible. The angle-of-attack the tanker required to maintain just above his 180-knot minimum airspeed directed his jet wash right through the basket and over my aircraft. We cleaned up to try again.

I finally got into the basket with just less than 1,000 pounds of fuel remaining but only could stay plugged and receiving when the tanker flew straight and level. I had filled up to 3,100 pounds but fell out of the basket as the tanker started a turn toward mom.

When I replugged for the remainder of the fuel, I inadvertently must have pulled the left throttle below 85-percent rpm. Suddenly, the aircraft reverted to

the MECH ON flight-control mode. The resultant undamped manual control of only the stabilators created an initial nose-down pitch, and my instinctive aft-stick correction caused a violent nose-up pitch. All I could do was pull the throttle to idle fast enough to avoid hitting the tanker. Once clear, but still fighting the PIOs (pilot induced oscillations), I stared down at the stick to find and hold a neutral point until the oscillations dampened. I finally managed to regain control at 1,800 feet, told the rep of the MECH ON reversion, and my current fuel state of 3,100 pounds. He immediately told me to hit the FCS reset button, which I did, and the system returned to normal. We all had seen enough by this point, so the rep said my signal was "divert." I selected that waypoint on the HSI (horizontal situation indicator) and started on my way.

Until this point, I liberally had been using afterburner on the good motor. My neutral power point was far higher than normal, and the afterburner detent almost was nonexistent in my mind. At the current density altitude, I was unable to climb at any airspeed close to the desired bingo profile. The combination of these factors led to my inadvertent selection of AB for several seconds to reach the 300 knots recommended to climb to 22,000 feet. But, I barely got above 16,000 feet. At this altitude, I no longer could climb at an airspeed greater than 250 knots, so I leveled off and accepted this as my final altitude.

Al Udeid, Qatar, was the primary divert. The rep and I discussed some of the field information. We thoroughly had briefed divert fields, and I felt comfortable with a 12,000-foot runway with arresting gear. At this time, the tanker from the next cycle appeared on my right wing, following an expeditious join-up. The rep suggested I get gas while we headed to Al Udeid. I got into the basket, much more aware of the 85-percent-rpm hurdle, with roughly 1,000 pounds of fuel and 60 miles remaining to the divert. I maintained 90-percent rpm and relayed the associated airspeed to the tanker pilot to get back in the basket. I felt intense relief as my fuel quantity started to climb. According to my calculations, I barely had enough gas to make the divert without tanking.

While tanking, I started to drift aft and added power. Immediately, the train came off the tracks. I watched as the probe unexpectedly popped out of the basket. I heard my only remaining engine (left) spool down, saw the cockpit lights go out, and was struck by a sudden and eerie quiet.

I transmitted in the blind, "I just lost my left engine."

I was in a 30,000-pound glider, listening to nothing but airflow over the canopy. I pulled the left throttle to OFF, lowered the nose to keep the left engine turning, put the APU switch to ON, and cranked the left motor. This restarting action also allowed me to maintain hydraulic pressure to the flight controls.

I began to prepare for what was sure to be a controlled ejection. Since it was dusk, I tried to get my flashlight on the standby gauges to ascertain altitude, attitude and airspeed. I waited as long as I could stomach it, and then brought the throttle around the horn. Nothing happened. I waited a moment and tried it again. Nothing. After the third try, I got some lights back but still had no fuel flow. Descending through 10,000 feet, I momentarily debated another restart or eject. I once more pulled the throttle OFF, and again back ON; the left engine came back to life.

For roughly two seconds, the feeling of relief was overwhelming. Then it was gone again when I realized with both engines offline, the INS had dumped, I had fallen 8,000 feet, and I had about 1,000 pounds of gas left.

Marshaling what seemed to be the last of my compartmentalization skills, I started to climb and headed roughly toward the divert. The HSI was rotating 90 degrees every few seconds as the jet began its in-flight alignment. I also had lost sight of the tanker. I called the rep and told him that I had managed to restart the left engine. I learned the tanker pilot had lost sight of me in the thick haze.

I knew I had been flying southwest before the flameout. I approximated my previous heading, based on the sun's position and my wet compass, knowing I needed to buy some time as the INS aligned. I heard the departure controller tell the tanker I was three miles south of his position. Moments later, the tanker triumphantly zoomed out in front of me, basket already out and ready to go. I worked my way into place and got the probe in the basket. No flow—nothing. The tanker pilot reset the basket.

It's hard to accurately convey the pucker factor I had, but with less than 500 pounds of gas, it was up there. He put the basket back out, and I jumped in again. Would you believe it? I still had no flow. Finally, he selected override on the basket and the "green light of life" came on. I later found out I had 371 pounds of fuel remaining before this last attempt to refuel.

I stayed in the basket and received about 4,000 pounds when the tanker said the divert field was on our nose at 14 miles. He said the active runway was 16 and gave me the tower frequency. I checked in with tower and asked if the runway lights were on—I couldn't see them. They said yes, so I asked them to turn the lights on full bright. The runway then came into focus. I slowed down to emergency-extend the gear, double-checked everything, and made sure my hook was down.

I expected the tanker or the ship already had coordinated a short-field arrestment, but I thought it wise to double-check the status of the gear with tower. They said, "Yes, the gear was raised." I touched down, expecting a brief rollout into the short-field gear. Shortly after touchdown, about the time I expected to engage the gear, tower came up on the radio and, in an excited voice, said, "The departure-end gear is rigged."

I already had decelerated below 100 knots and was rolling down the runway with no nosewheel steering. I let the aircraft track on its own until a slight left drift began. I then reached down and selected emergency brakes. Using as much right rudder as I could, I finally was forced to use the emergency brakes to keep the aircraft on the runway.

Knowing the Hornet's reputation for blowing tires while using emergency brakes, I gently tried to brake, but immediately after I applied the brakes, the left mainmount blew. I was headed off the runway and checked the airspeed as it passed just below 80 knots. If you've ever been to Al Udeid, you know it is flat, hard-packed earth and rock that might as well be asphalt. I decided not to eject.

The ride was very bumpy, but not violent. The jet finally came to a stop in the dirt after about 2,000 feet of off-roading, halfway between the runway and the parallel taxiway. I set the parking brake, shut off everything, and after the crash crew lowered the ladder, shakily climbed down to solid ground.

Postflight analysis showed the right engine suffered catastrophic combustion-liner failure, along with a major crack in the oil reservoir. The engine internally FODed itself, which caused the initial flameout. This action happened so quickly it did not trigger any associated engine or oil cautions. With no preflight indicators of this impending failure, a single-engine situation effectively was impossible to avoid.

Now that I'm back to "1G straight and level," I am thankful for many things, but I could have done better. A point of discussion was the decision to take a look at the ship. No naval aviator likes to dump 8,000 pounds of gas and intentionally put themselves below divert-bingo numbers. This was our first, no kidding, single-engine approach of the deployment, although we'd been through several idled-engine approaches. An accurate final bearing would have allowed an approach on the first try, when I was more prepared and likely sharper.

Single-engine tanking brings many factors to the table and has stimulated much ready-room discussion. Although use of afterburner on the bingo profile is not directed, my sensitivity to the afterburner detent virtually was nonexistent after 30 minutes of flight that frequently required min burner or more. I was unable to reach the profile parameters at military power because of the increased density altitude. The big gotcha, however, comes when we analyze why I lost my left and only remaining engine.

As a result of continually cross-bleeding the right engine to maintain reliable flight controls (after a series of subsequent flight-control failures), we trapped fuel in the No. 3 feed tank and starved the good motor. In hindsight, we agreed pushing the FIRE light at lower fuel states would have been worth the risk of overheating the good engine's AMAD (airframe-mounted-accessory drive). I also gained an appreciation of the second tanker's lack of situational awareness regarding my emergency. I never gave the second tanker a quick rundown of the situation on his join-up. I assumed he arrived on the scene fully aware of my emergency.

Finally, there was much confusion about the short-field arrestment. My intent, from the moment I was given the signal to divert, was to trap at Al Udeid. I assumed this would be coordinated by someone not flying the emergency jet; I would confirm once I got in touch with approach control. Obviously, this coordination did not happen in the flurry of emergencies. I tried to confirm the arrestng gear on tower frequency, but the Air Force often thinks of gear as a departure-end item, not in the sense of short-field traps like the Navy.

The plane, and possibly my life, were spared as a result of excellent teamwork and CRM. At the very least, I won't be laughing or rolling my eyes during the next NATOPS simulator when it provides multiple compound emergencies.

Lt. Littman flies with VFA-81.